

STEAM

Cost Reduction Strategies



REDUCING YOUR STEAM SYSTEM ENERGY BILL

Did you know...
the steam used in
flat-rolled finishing mills
can represent up to 10%
of all energy used in an
integrated mill?

Boilers play a particularly important role in integrated mills because they not only provide the steam needed for key processes (such as humidification of blast furnace wind and heating of pickling, cleaning, and coating lines) but also consume by-product fuels generated in the coke ovens, blast furnace, and BOF. Natural gas and other purchased fuels are typically used to supplement the by-product fuels.

Initial Steps

The following steps will help you identify those areas of your steam system most likely to yield near-term savings. These steps are based upon experience gained from conducting successful in-plant steam system assessments and are designed to help steel mills in prioritizing their efforts to focus on the greatest benefits in the shortest timeframe.

STEP 1

Determine how much you pay to make steam

- This cost analysis will suggest the magnitude of possible steam efficiency savings at your facility.

STEP 2

Understand how your steam system functions

- Determine steam generation rates, pressures, control mechanisms, and other key characteristics of your steam system.
- Develop a simple flow diagram for your steam system.

STEP 3

Determine the key steam end-use processes at your facility

- Define the major end-use equipment (e.g., heat exchangers) and operations (e.g., acid bath heating, vacuum degassing) that need to be maintained.

STEP 4

Perform an initial inspection

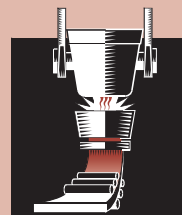
- Identify any obviously malfunctioning pieces of equipment, large steam leaks, etc.

Evaluate and take action

The table on the reverse lists energy-saving measures associated with improving the performance of your steam system. For each of the measures, the table includes example activities, typical implementation period, and payback period.



Improvement Area	Energy-Saving Measure	Typical Implementation Period	Typical Payback Period
Steam/Product Benchmarks	Identify how much steam it takes to make your key products in cost per ton or cost per unit of product. Track this benchmark and compare a) with what other facilities in your company do; b) with how your competitors do; and c) with how this benchmark varies in your operations over time.		
Steam System Measurements	Identify key steam operational parameters that you should monitor and ensure that you are adequately measuring them.		
Steam Trap Maintenance	Implement a program to correctly select, test, and maintain your steam traps.	Hours to months	Weeks to months
Water Treatment Program	Implement and maintain an effective water treatment program in your steam system.	Days to months	Months to years
System Insulation	Determine the economic insulation thickness for your system components, and perform system insulation reviews to identify exposed surfaces that should be insulated.	Hours to months	Weeks to months
Steam Leaks	Identify and quickly repair steam leaks in your steam system.	Hours to months	Hours to months
Vent Losses	Identify and reduce steam vent losses in your steam system.	Hours to months	Hours to months
Steam System Maintenance	Establish and carry out a comprehensive steam system maintenance program.	Continuous	Hours to months
Boiler Efficiency	Gauge new opportunities to improve your boiler efficiency.	Days to months	Months
Heat Recovery Equipment	Evaluate installation of heat recovery equipment in your boiler plant.	Weeks to months	Months to years
Review Fuel Use	Look for opportunities to maximize use of low-energy fuel sources.	Continuous	Days to months
Minimize Steam Flow Through PRVs	Many plants use Pressure Reducing Valves (PRVs) to perform pressure reduction. If your facility does this, investigate opportunities to reduce pressure using backpressure steam turbines instead of PRVs. In many plants, backpressure steam turbines can be used to generate electricity or shaft power.	Months to years	Months to years
Key Steam End-Use Equipment	Identify key steam end-use operations and equipment in your mill. Ensure that these operations are working efficiently and equipment is functioning properly.	Hours to months	Hours to years
Effective Steam Control	Ensure that your steam control scheme does not waste steam.	Hours to months	Hours to months
Condensate Recovery	Utilize available recovered condensate.	Weeks to months	Days to years
Wasted High-pressure Condensate	Investigate opportunity to use high-pressure Condensate to produce usable low-pressure steam.	Weeks to months	Months to years



OTHER RESOURCES

OIT Clearinghouse
800-862-2086

www.oit.doe.gov/bestpractices